

Claims

1 ✓ 1. A submersible gas compressor comprising:  
2       a ceramic high pressure piston in contact with a ceramic sleeve;  
3       a drive piston mounted to said ceramic high pressure piston such that  
4       movement of said drive piston simultaneously moves said ceramic high  
5       pressure piston; and  
6       a crank in mechanical connection with said drive piston.

1       2. The compressor of claim 1 further comprising a thermal  
2       immersion tank comprising a liquid heat transfer fluid.

1 ✓ 3. The compressor of claim 1 further comprising a compliant  
2       coupling between said ceramic high pressure piston and said drive piston.

1 ✓ 4. The compressor of claim 1 wherein said crank has a double  
2       hung shaft operating independent of cantilever motion.

1 ✓ 5. The compressor of claim 1 wherein said ceramic high pressure  
2       piston contacts said ceramic sleeve independent of a lubricating liquid.

1       6. The compressor of claim 1 wherein the reciprocating movement  
2       of said drive piston cycles between 600 and 800 cycles per minute.

1           7.     The compressor of claim 2 wherein the liquid heat transfer fluid  
2     is an aqueous solution.

1           8.     A gas delivery system comprising:  
2                a first stage compressor pressurizing an inlet gas to between 90 and  
3     500 psig;  
4                a first absorption bed comprising a molecular sieve material in fluid  
5     communication with said first stage compressor, said absorbent bed enriching  
6     an exiting gas stream in at least one inlet gas component;  
7                a second stage compressor immersed in a liquid heat transfer fluid,  
8     compressing the exiting gas stream to a pressurized gas stream having a  
9     pressure of between about 5000 and 10,000 psig;  
10              a cascade system for storing the pressurized gas stream at a pressure  
11     between about 3500 and 5000 psig;  
12              a control system in operational control of at least one of said first stage  
13     compressor, said absorbent bed, said second stage compressor and said cascade  
14     system; and  
15              an outlet for delivering said pressurized gas stream.

*first*

1           9.     The gas delivery system of claim 8 wherein said molecular sieve  
2     is type 5A and said at least one inlet gas component is oxygen.

1           10. The gas delivery system of claim 8 further comprising a  
2 blending valve interspersed between said absorbent bed and said second stage  
3 compressor for delivering in combination the exiting gas stream and the inlet  
4 gas.

1           11. The gas delivery system of claim 8 further comprising at least  
2 one monitoring device selected from the group consisting of: pressure gage,  
3 oxygen concentration gage, and thermocouple, coupled to said cascade system  
4 and providing data to said control system.

1           12. The gas delivery system of claim 8 further comprising a  
2 blending valve in fluid communication with said outlet and the inlet gas for  
3 delivering in combination pressurized gas stream and outlet gas.

1           13. The gas delivery system of claim 8 further comprising a second  
2 absorption bed.

1           14. The gas delivery system of claim 13 wherein the first absorption  
2 bed is connected in series with the second adsorption bed.

1           15. The gas delivery system of claim 13 wherein the first absorption  
2 bed is connected in parallel with the second adsorption bed.